

DETAILED ACTION

Response to Amendment

1. Applicant's amendments filed on 02/16/10 have been entered. Claims 1-4, 8-13, 20-26 are currently under examination on the merits.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 26 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 26 recites a negative limitation (i.e. no at least one other thermoplastic resin) which contradicts the at least one other thermoplastic resin that is required by claim 1 which claim 26 is dependent on. Therefore it is unclear if the other thermoplastic is some other thermoplastic than the one described in claim 1 or if it is the same one.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
7. Claims 1-4, 8-13 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (JP 07-085722), see Translation (NPL document U), in view of Kouyama et al. (U.S. 4,897,238) and further in view of Krone et al. (U.S. 4,937,032).

Regarding claims 1 and 20-24, Yoshida et al. discloses a semiconductive film having a composition of 5-40 parts conductive filler to 100 parts polymer ([0008]), inter alia poly ether ether ketone, ([0007]). The conductive filler of Yoshida et al. is disclosed as being sold under the trade name "KETCHIEN black EC," which is believed to be the same as the instantly disclosed "Ketjen Black EC" (Example 1, Page 36). Yoshida et al. also discloses that the semiconductive film have a volume resistivity of between 10^{11} and 10^{12} ([0013]), with a variation of 1-10 times the minimum value, which overlaps the instantly claimed range. The thickness is also disclosed as being 150 microns thick ([0012]). The carbon black used has a DBP oil absorption rate that reads on the claims (See Yoshida Claim 1). Yoshida et al. does not explicitly disclose the product by process steps of claim 1. Kouyama et al., with is also directed

towards extruded sheets made out of PEEK and resins substantially chemically equivalent to PEEK for the purposes of extrusion (C1, L55-65, C8, L35-65). Kouyama et al. discloses that the extrusion occur with a lip clearance of 0.5mm and a cooling temperature of 79 degree C, which is about 80 degrees C (C17, L30-40). The cooling conditions and extrusion methods of Kouyama et al. are disclosed as resulting in an amorphous film (C10, L30-40). One having ordinary skill in the art would have found it obvious to have used the lip clearance and cooling temperature of Kouyama et al. in the method of making the film from the composition of Yoshida et al. in order to impart desirably amorphous properties to the product.

Regarding the "Folding Endurance," considering the substantially identical composition and method of forming the film of the disclosed semiconductive resin of the prior art with the instantly disclosed examples (i.e. Example 1, page 36-37), the semiconductive film of modified Yoshida et al. would exhibit the instant claimed properties. Regarding the consistency of the film's thickness, it would have been obvious to one having ordinary skill in the art to have maintained the most consistent thickness along the length of the film in order to minimize variation in the semiconductive properties of the belt.

Regarding the "at least one other thermoplastic," Kouyama discloses that additives can be incorporated into the PEEK resin mixture (C9, L55-65) but does not go into any specifics as to how much. Krone et al. which is directed towards a PEEK containing composition (C5, L10-45) discloses similar additives to those reference in Kouyama and specifically mentions that thermoplastic impact modifiers and elastomers can be used as additives at up to 15 percent by weight. Hence it would have been obvious to have added the engineering thermoplastic impact modifiers and elastomers as additives at less than 15% as taught by Krone to the composition of

modified Yoshida to adjust the impact strength and elastomeric properties of the overall composition. Also, independent of the Krone reference, one having ordinary skill in the art would have found it obvious that the additive mentioned in Kouyama would include some thermoplastic additives and that they would be present in a relatively small amount compared to the main components of the film (i.e. an amount less than 5%).

With respect to claims 2-4, regarding the various physical properties (tensile, tension and tear strength) as with the folding endurance, given the substantially similar ingredients and process conditions, the prior art's film would possess these properties.

With respect to claim 20, the carbon black used has a DBP oil absorption rate that reads on the claims (See Yoshida Claim 1). With respect to claim 21, Yoshida et al. also discloses that the semiconductive film have a volume resistivity of between 10^{11} and 10^{12} ([0013]), with a variation of 1-10 times the minimum value, which overlaps the instantly claimed range. With respect to claim 22, as explained with reference to claim 1 above, given the substantially similar ingredients and processing conditions of the film of the prior art the instantly claimed folding properties would be present. With respect to claims 23 and 24, Kouyama discloses the instantly claimed processing conditions. Kouyama et al. discloses that the extrusion occurs with a lip clearance of 0.5mm and a cooling temperature of 79 degree C, which is about 80 degrees C (C17, L30-40).

Regarding claims 8-13, modified Yoshida et al. discloses all of the limitations as set forth above. Additionally, Yoshida et al. discloses that the conductive filler is carbon black and has a DBP in the range of 30-700 ml (i.e. B and A with DBP of 200-700 and 30-180 ml, [0004]). The carbon black used "KETCHIEN black EC," is believed to be the same as the instantly disclosed

"Ketjen Black EC" (Example 1, Page 36) and is an acetylene or oil furnace black. Given the substantially similar type of carbon black (i.e. tradename and DBP ratio) the conductive filler of Yoshida et al. will exhibit the claimed volume resistivity and volatile matter content as instantly claimed in claims 8-10. With respect to claims 11-13, Yoshida et al. also discloses that the semiconductive film be used as a charge control member either as part of a tuber roller or a semiconductive belt ([0010]).

8. With respect to claim 25, the instantly claimed chemical structure is that of a poly ether ether ketone which is disclosed in all the prior art references (See Yoshida, [0007]). In Kouyama when PEEK is combined with PTK the PEEK is not disclosed as being a copolymer and is therefore a homopolymer. With respect to claim 26, the additives disclosed in Kouyama and Krone are optional and therefore do not have to be incorporated.

Response to Arguments

9. Applicant's arguments are considered moot in light of the new grounds of rejection which were necessitated by applicant's amendments. Arguments which are still deemed to be relevant are addressed below.

10. Applicant argues that Yoshida teaches away from the processing conditions in Kouyama by the single example in Yoshida. The single example in Yoshida does not teach away from the processing conditions in Kouyama because there is no mention in Yoshida as to any criticality of the processing conditions used in the examples.

11. Applicant argues their cooling temperature yields unexpected results however they have failed to show the criticality at both endpoints of the range (i.e. there is no data showing that above 120 degrees the thickness uniformity would be above 1.2. In fact, some of the data point

within the claimed cooling temperature range fall outside of the claimed max to min thickness ratio range (i.e. 1-1.2 is claimed but for cooling of 90 and 110 degrees the ratio is 1.3).

Applicant must amend the claims to be commensurate with the scope of the unexpected results.

12. Applicant then argues that Kouyama teaches away from PEEK in their film however at C9, L15-30, PEEK's are specifically mentioned as being desired in certain circumstances where their increased prices is outweighed by their particularly beneficial toughness. Therefore Kouyama teaches the combination of PEEK and PTK. Applicant also argues that the new limitation to claim 1 overcomes the Kouyama composition but this is not the case. The instant amendment only discloses that one thermoplastic resin (not necessarily PTK) must be contained at less than 5 parts per 100. This does not limit the PTK in the compositions or any other resins that may be added so long as one thermoplastic resin is contained at less than 5 parts per 100 PEEK any other resin can be added in any other amount. To overcome the Kouyama reference and move the case closer to allowance applicant is advised to amend the claim to read: "at least on other thermoplastic resin, wherein all thermoplastic resins other than PEEK are present in a proportion of at most 5 parts by weight per 100 parts by weight of poly(ether ether ketone)." Applicant appears to have support for this limitation at page 19 and 20. Amending the claim thusly will overcome the Kouyama reference and will move the condition closer to allowance.

13. Applicant is also advised that the process limitations (i.e. lip clearance and cooling temperature) need to be shown to both materially effect the final product to be given patentable weight and need to be shown to affect the film in a non-obvious (i.e. unexpected) way. Therefore in the next communication with the office, applicant should provide declarations showing how the lip clearance and the cooling temperature, at the particular claimed ranges,

effect the final product and have unexpected effects on the properties of the film. Applicant must also make sure that the claimed properties properly reflect the unexpected results (i.e. contrary to the relationship between the cooling temperatures and the max/min ration in the most recent declaration as explained above).

14. With respect to applicant's arguments that the extrusion conditions of a dissimilar resin composition cannot be used to modify another resin composition, the examiner agrees but the argument is moot because the current claims allow for the PTK/PEEK composition of Kouyama. As state above, properly amending the claims to reflect the aspect of the invention disclosed at page 19 and 20 of the specification would prohibit the inclusion of so much PTK as taught by Kouyama and would prevent the processing steps from being used to modify Yoshida.

15. If applicant desires a telephone interview to clarify these points and the proposed amendments the examiner can be reached at 571-270-3877.

16. Applicant is also advised that to rejoin the process claims with the product claims if they are found allowable the process claims must contain all the limitations of the allowable product claim.

17. References considered but not relied upon in the current rejection include: Matsumura et al. (U.S. 5,242,648) and Satake et al. (U.S. 4,895,892).

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL B. NELSON whose telephone number is (571) 270-3877. The examiner can normally be reached on Monday through Thursday 6AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571) 272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Patricia L. Nordmeyer/

Primary Examiner, Art Unit 1783

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